OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **LITTLE ROUND POND** the program coordinators recommend the following actions.

FIGURE INTERPRETATION

Station 1

- Figure 1: These graphs illustrate concentrations of chlorophyll-a in the water column. Algae are microscopic plants that are a natural part of lake ecosystems. Algae contain chlorophyll-a, a pigment necessary for photosynthesis. A measure of chlorophyll-a can indicate the abundance of algae in a lake. The historical data (the bottom graph) show a *worsening* in-lake chlorophyll-a trend, meaning concentrations are increasing. Mean chlorophyll concentration decreased this season, and the return of rain most likely helped to keep the flushing rate at a healthy level. July results were quite low, while August showed an increase, with golden-browns being the dominant algae. While algae are present in all lakes, an excess amount of any type is not welcomed. Concentrations can increase when there are external and internal sources of phosphorus, which is the nutrient algae depend upon for growth. It's important to continue the education process and keep residents aware of the sources of phosphorus and how it influences lake quality.

- Figure 2: Water clarity is measured by using a Secchi disk. Clarity, or transparency, can be influenced by such things as algae, sediments from erosion, and natural colors of the water. The graphs on this page show historical and current year data. The lower graph shows a *fairly stable* trend in lake transparency for the past three years, but readings have decreased from the early 1990s. Transparency results improved this season, and the low algal abundance in July may have resulted in an increased Secchi disk reading. Mean transparency values have remained above the NH mean reference line since Little Round Pond joined the VLAP program. The 2000 sampling season was considered to be wet and, therefore, average transparency readings are expected to be slightly lower than last year's readings. Higher amounts of rainfall usually cause more eroding of sediments into the lake and streams, thus decreasing clarity.

- Figure 3: These figures show the amounts of phosphorus in the epilimnion (the upper layer in the lake) and the hypolimnion (the lower layer); the inset graphs show current year data. Phosphorus is the limiting nutrient for plants and algae in New Hampshire waters. Too much phosphorus in a lake can lead to increases in plant growth over time. These graphs show a *stable* trend for in-lake phosphorus levels. The phosphorus concentration in the epilimnion and hypolimnion was consistent and fell below the median for NH lakes. One of the most important approaches to reducing phosphorus levels is educating the public. Humans introduce phosphorus to lakes by several means: fertilizing lawns, septic system failures, and detergents containing phosphates are just a few. Keeping the public aware of ways to reduce the input of phosphorus to lakes means less productivity in the lake. Contact the VLAP coordinator for tips on educating your lake residents or for ideas on testing your watershed for phosphorus inputs.

NOTES

- Monitor's Note (8/1/00): Two loons, two babies.

FIGURE INTERPRETATION

Station 2

- Figure 1: The chlorophyll-a concentration was very similar to those found at Station 1, and was lower than last season's results. The concentration was elevated in August and golden-brown algae were also dominant at this station.

- Figure 2: Transparency results have been relatively stable at this station. Water clarity is slightly lower than at Station 1, but also remains above the NH mean reference line. The slight decrease in water clarity in August was probably due to the increase in algal abundance.

- Figure 3: The phosphorus concentration at Station 2 is stable in the epilimnion, and appears to be improving in the hypolimnion. Concentrations in both layers were relatively the same, and also were consistent with those at Station 1. Dissolved oxygen concentrations are at a desirable level for both stations and are not contributing to an internal source of phosphorus to the pond.

OTHER COMMENTS

- Dissolved oxygen was again high at all depths of Station #1 and Station #2 in the pond (Table 9). As stratified lakes age, oxygen is depleted in the lower layer by the process of decomposition. The lack of this aging indicator is a sign of the lake's overall health.

- In-lake conductivity increased again this season (Table 6) for both stations. It seems that the rainfall increased the amount of nutrients

entering the pond from the watershed. This increase in conductivity could be a sign of increased human impacts on the pond. It would be useful to uncover the reasons for the increase. We recommend testing any inlets that may flow into the pond.

USEFUL RESOURCES

Comprehensive Shoreland Protection Act, RSA 483-B, WD-BB-35, NHDES Fact Sheet. (603) 271-3503 or www.state.nh.us

Proper Lawn Care Can Protect Waters, WD-BB-31, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

In Our Backyard. 1994. Terrence Institute, 4 Herbert St., Alexandria, VA. 22305, or call (800) 726-4853.

Native or Naturalized Shoreland Plantings for New Hampshire. NHDES Shoreland Protection Program. (603) 271-3503

Clean Water in Your Watershed. Terrene Institute, 1993. (800) 726-5253, or www.terrene.org

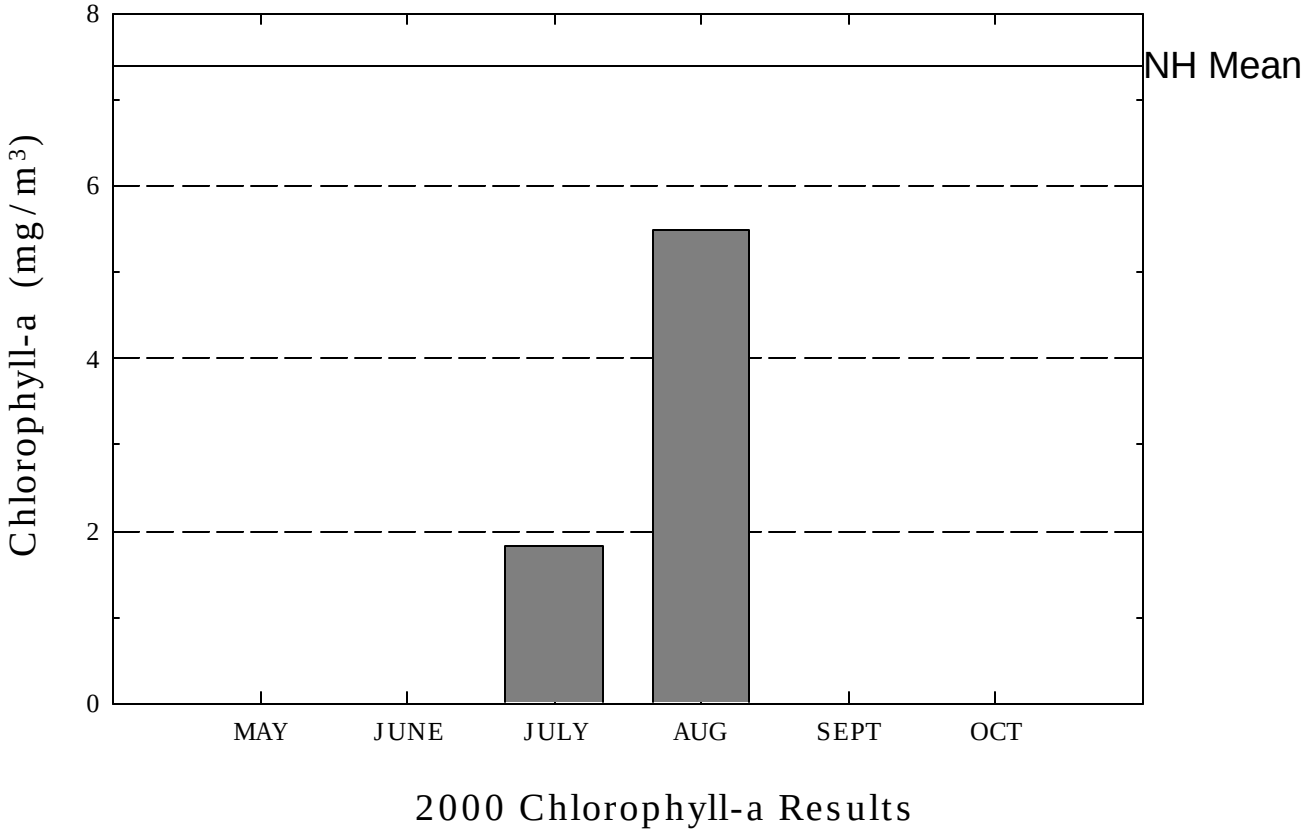
What is a Watershed?, NH Lakes Association pamphlet, (603) 226-0299 or www.nhlakes.org

Handle With Care: Your Guide to Preventing Water Pollution. Terrene Institute, 1991. (800) 726-5253, or www.terrene.org

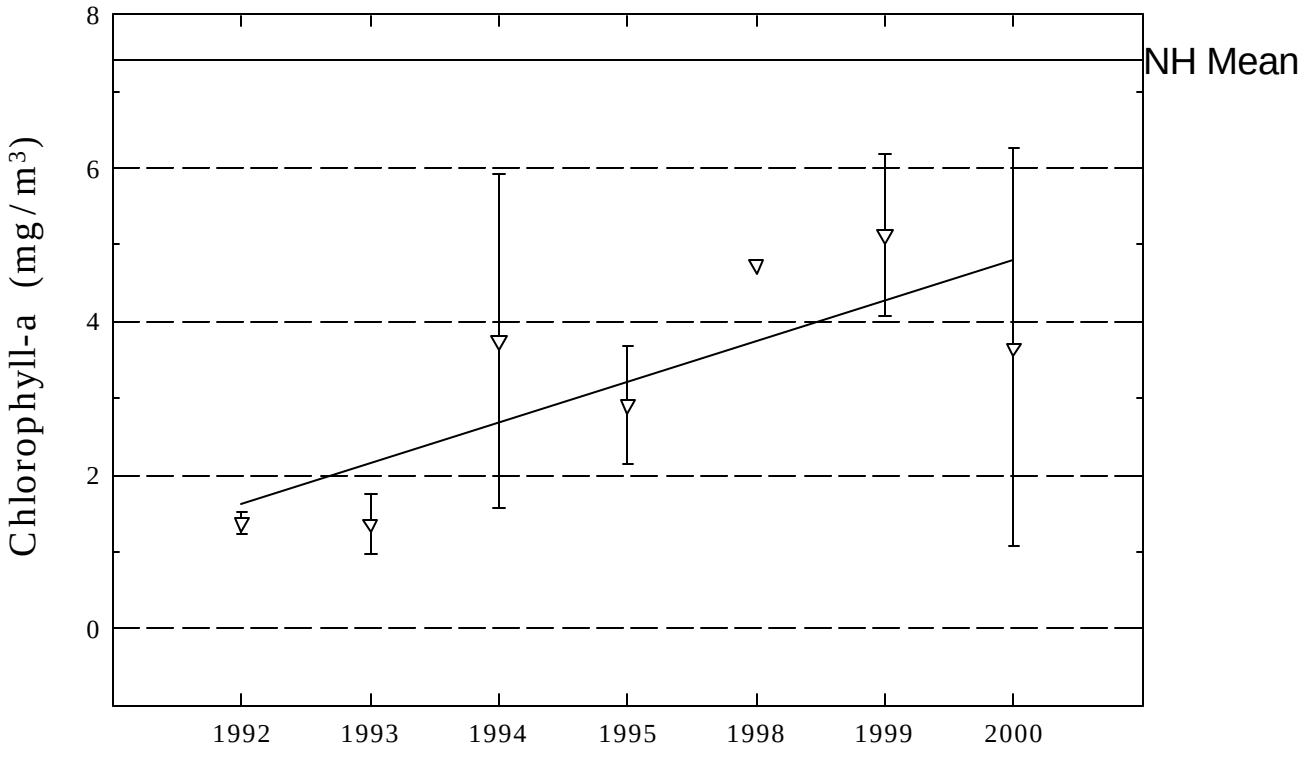
Road Salt and Water Quality, WD-WSQB-7, NHDES Fact Sheet, (603) 271-3503 or www.state.nh.us

Little Round Pond, Station 1

Figure 1. Monthly and Historical Chlorophyll-a Results



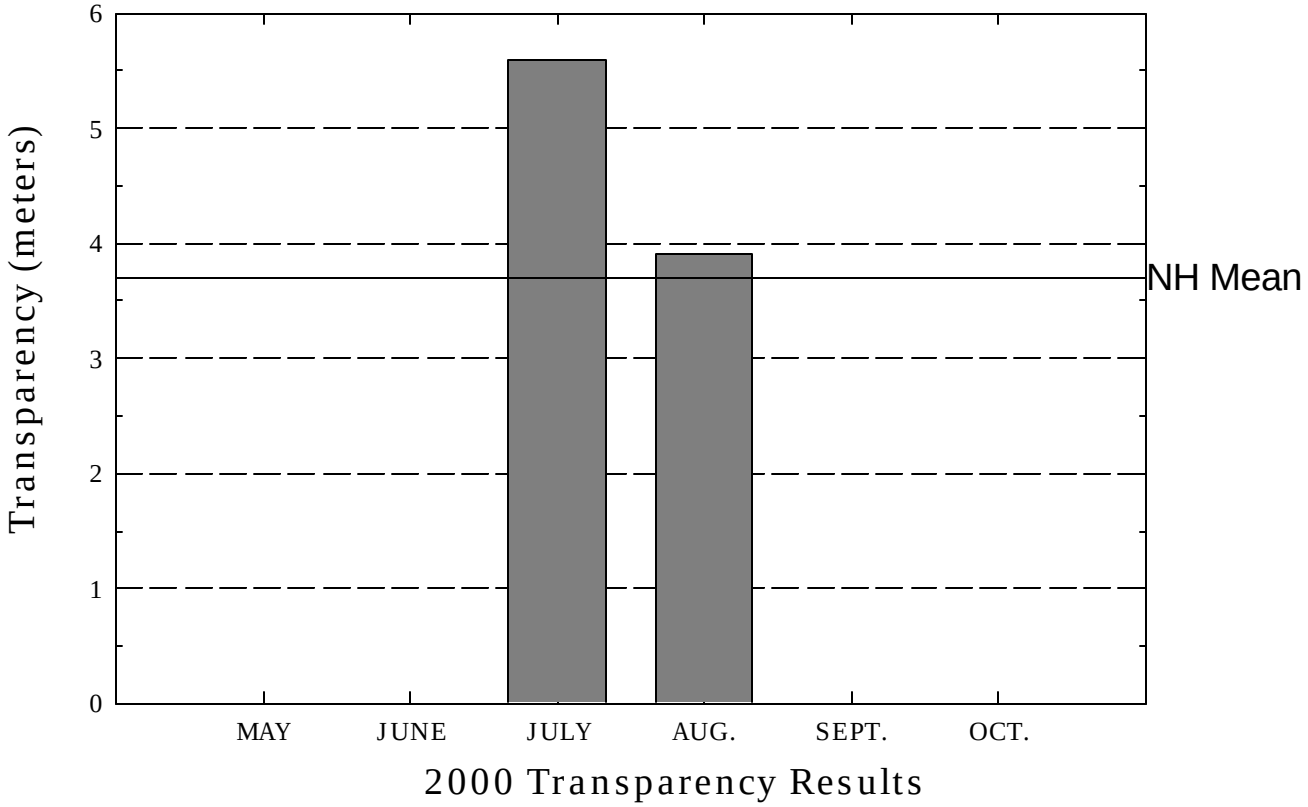
2000 Chlorophyll-a Results

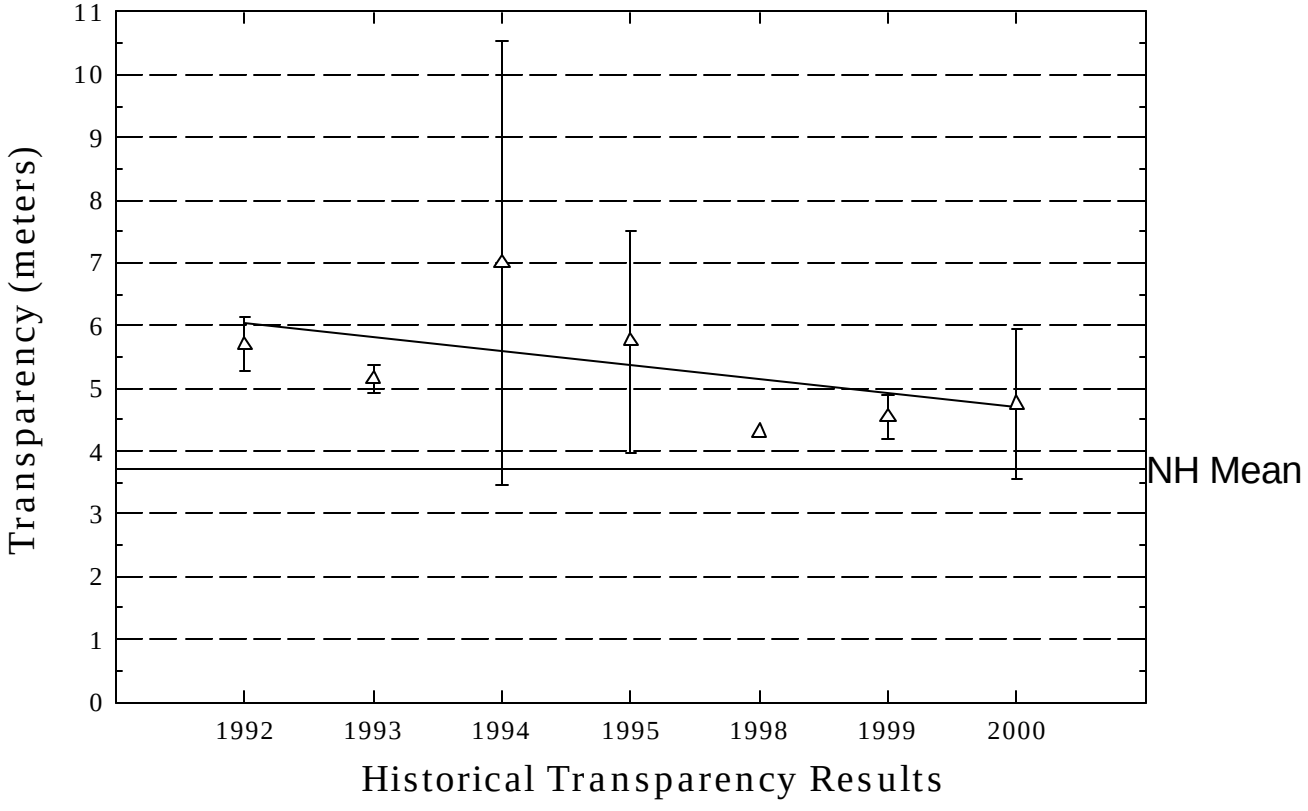


Historical Chlorophyll-a Results

Little Round Pond, Station 1

Figure 2. Monthly and Historical Transparency Results





Little Round Pond, Station 1

Figure 3. Monthly and Historical Total Phosphorus Data.

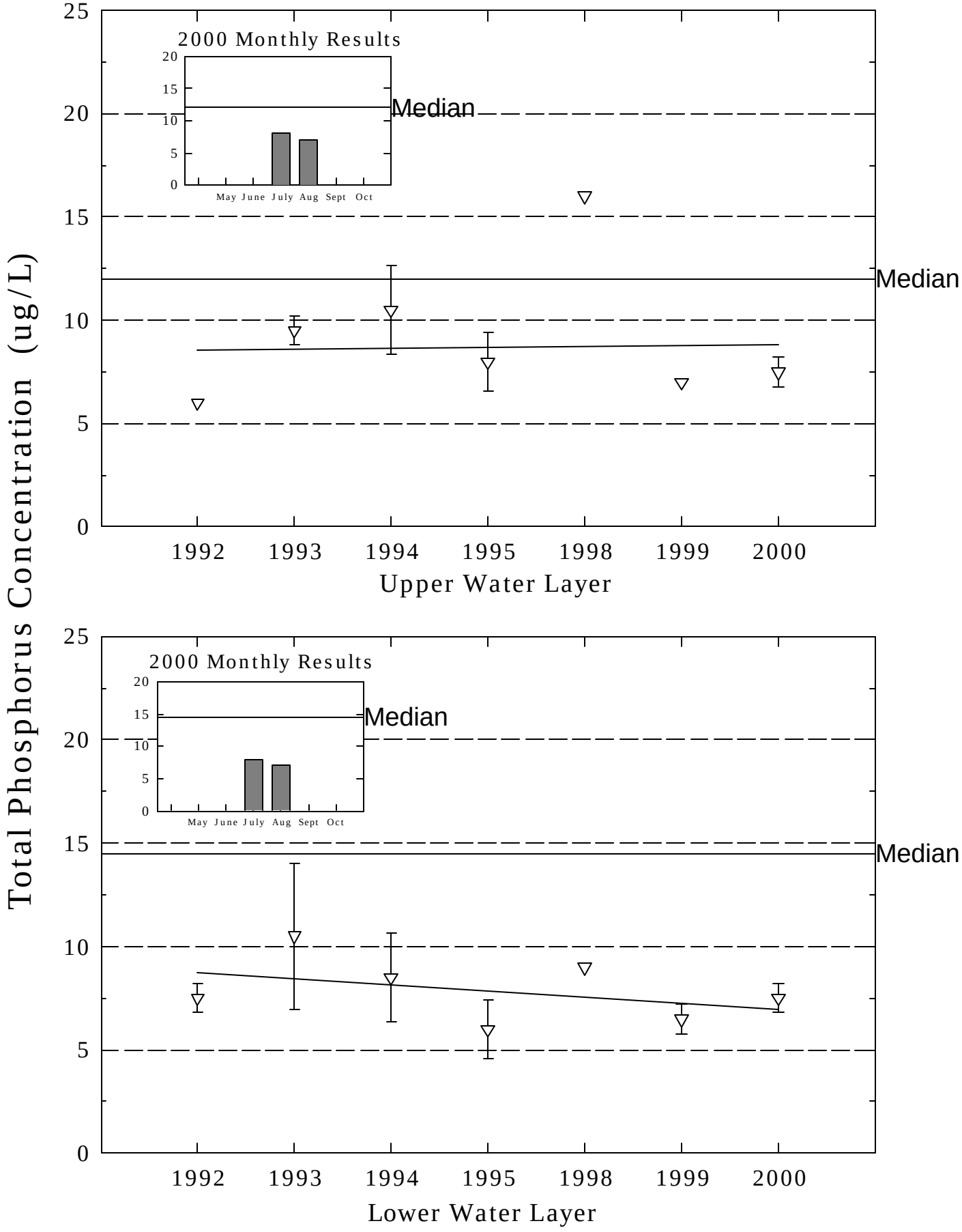


Table 1.

ROUND POND, LITTLE STN #1

WAKEFIELD

Chlorophyll-a results (mg/m^3) for current year and historical sampling periods.

Year	Minimum	Maximum	Mean
1992	1.28	1.47	1.37
1993	1.09	1.64	1.36
1994	2.20	5.29	3.74
1995	2.37	3.46	2.91
1998	4.74	4.74	4.74
1999	4.39	5.88	5.13
2000	1.83	5.50	3.66

Table 2.

ROUND POND, LITTLE STN #1

WAKEFIELD

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
07/02/1992	DINOBRYON	98
09/01/1992	CERATIUM	49
	DINOBRYON	43
	ANABAENA	5
07/09/1993	DINOBRYON	94
07/26/1994	CHRYSOSPHAERELLA	94
08/21/1995	CHRYSOSPHAERELLA	83
	DINOBRYON	9
	COSMARIUM	3
07/09/1999	DINOBRYON	35
	STAURASTRUM	26
	EUDORINA	23
08/01/2000	DINOBRYON	81
	STAURASTRUM	8
	UROGLENOPSIS	7

Table 3.

ROUND POND, LITTLE STN #1

WAKEFIELD

Summary of current and historical Secchi Disk transparency results (in meters).

Year	Minimum	Maximum	Mean
1992	5.4	6.0	5.7
1993	5.0	5.3	5.1
1994	4.5	9.5	7.0
1995	4.5	7.0	5.7
1998	4.3	4.3	4.3
1999	4.3	4.8	4.5
2000	3.9	5.6	4.7

Table 4.

ROUND POND, LITTLE STN #1

WAKEFIELD

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1992	6.65	6.72	6.68
	1993	6.66	6.92	6.77
	1994	6.67	6.93	6.78
	1995	6.55	7.02	6.72
	1998	6.72	6.72	6.72
	1999	6.15	6.45	6.27
	2000	6.38	6.44	6.41
HYPOLIMNION				
	1992	6.44	6.69	6.55
	1993	6.71	6.85	6.77
	1994	6.49	6.55	6.52
	1995	5.94	5.97	5.95
	1998	6.38	6.38	6.38
	1999	6.32	6.38	6.35
	2000	6.37	6.50	6.43

Table 5.

ROUND POND, LITTLE STN #1

WAKEFIELD

Summary of current and historical Acid Neutralizing Capacity.
Values expressed in mg/L as CaCO .

Epilimnetic Values

Year	Minimum	Maximum	Mean
1992	2.20	2.70	2.45
1993	2.10	2.40	2.25
1994	3.10	3.20	3.15
1995	2.50	3.50	3.00
1998	2.40	2.40	2.40
1999	2.20	2.40	2.30
2000	2.00	2.30	2.15

Table 6.

ROUND POND, LITTLE STN #1
WAKEFIELD

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1992	46.7	46.9	46.8
	1993	46.4	50.8	48.6
	1994	52.2	52.9	52.5
	1995	50.2	50.8	50.5
	1998	66.9	66.9	66.9
	1999	70.3	71.7	71.0
	2000	74.6	76.3	75.4
HYPOLIMNION				
	1992	46.8	47.0	46.9
	1993	46.1	51.2	48.6
	1994	52.9	53.0	52.9
	1995	51.1	52.0	51.5
	1998	67.1	67.1	67.1
	1999	70.8	71.0	70.9
	2000	74.6	75.3	74.9

Table 8.

ROUND POND, LITTLE STN #1

WAKEFIELD

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1992	6	6	6
	1993	9	10	9
	1994	9	12	10
	1995	7	9	8
	1998	16	16	16
	1999	7	7	7
	2000	7	8	7
HYPOLIMNION				
	1992	7	8	7
	1993	8	13	10
	1994	7	10	8
	1995	5	7	6
	1998	9	9	9
	1999	6	7	6
	2000	7	8	7

Table 9.

ROUND POND, LITTLE STN #1

WAKEFIELD

Current year dissolved oxygen and temperature data.

Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
		August 1, 2000	
0.1	22.3	7.4	84.0
1.0	22.4	7.4	84.0
2.0	22.4	7.3	83.0
3.0	22.3	7.2	82.0
4.0	22.3	7.2	82.0
5.0	22.3	7.3	83.0
5.5	22.2	7.1	81.0

Table 10.

ROUND POND, LITTLE STN #1

WAKEFIELD

Historic Hypolimnetic dissolved oxygen and temperature data.

Date	Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
July 2, 1992	5.5	22.5	9.3	106.0
September 1, 1992	5.0	22.0	9.5	109.3
July 9, 1993	5.3	26.3	8.3	102.0
July 26, 1994	5.0	26.0	6.8	83.0
August 21, 1995	5.0	24.9	8.0	95.0
July 9, 1999	5.5	24.1	8.0	94.9
August 1, 2000	5.5	22.2	7.1	81.0

Table 11.

ROUND POND, LITTLE STN #1

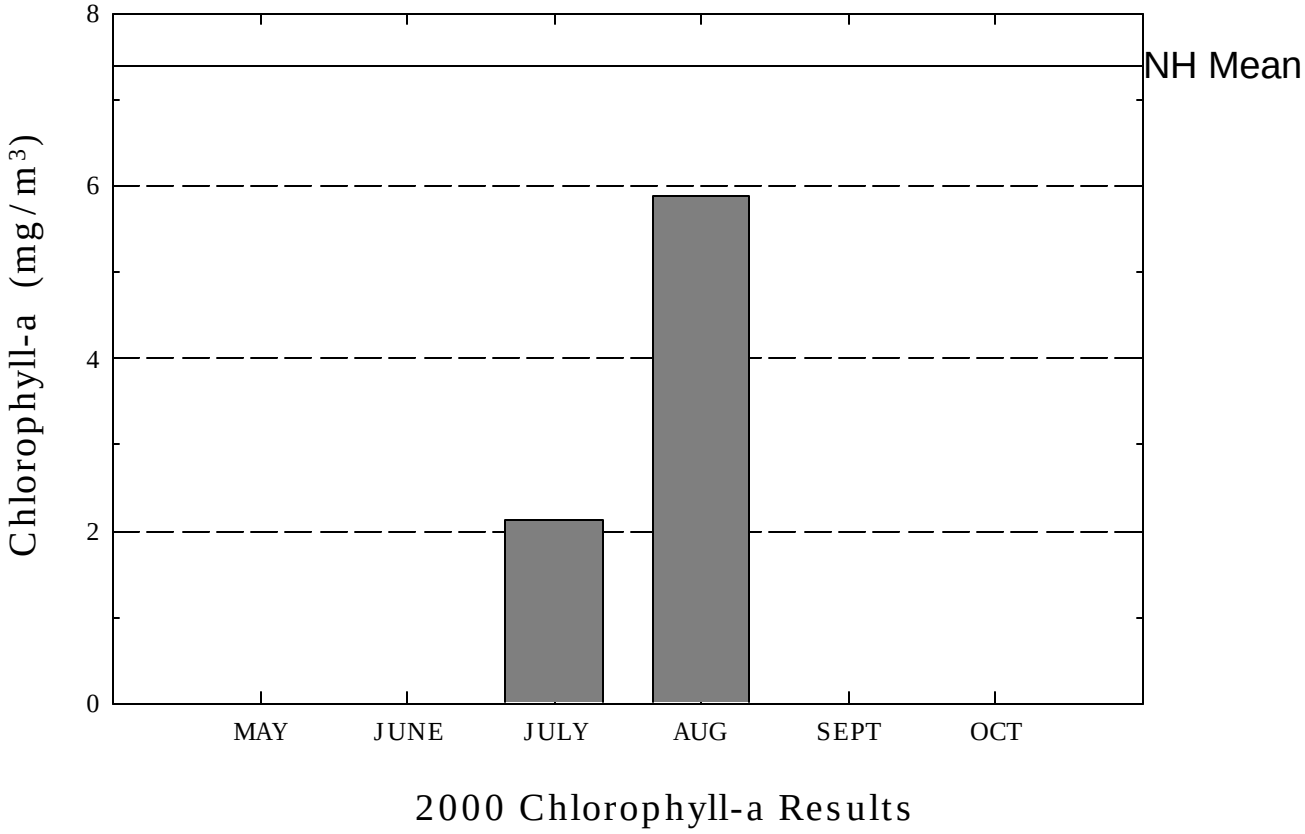
WAKEFIELD

Summary of current year and historic turbidity sampling.
Results in NTU's.

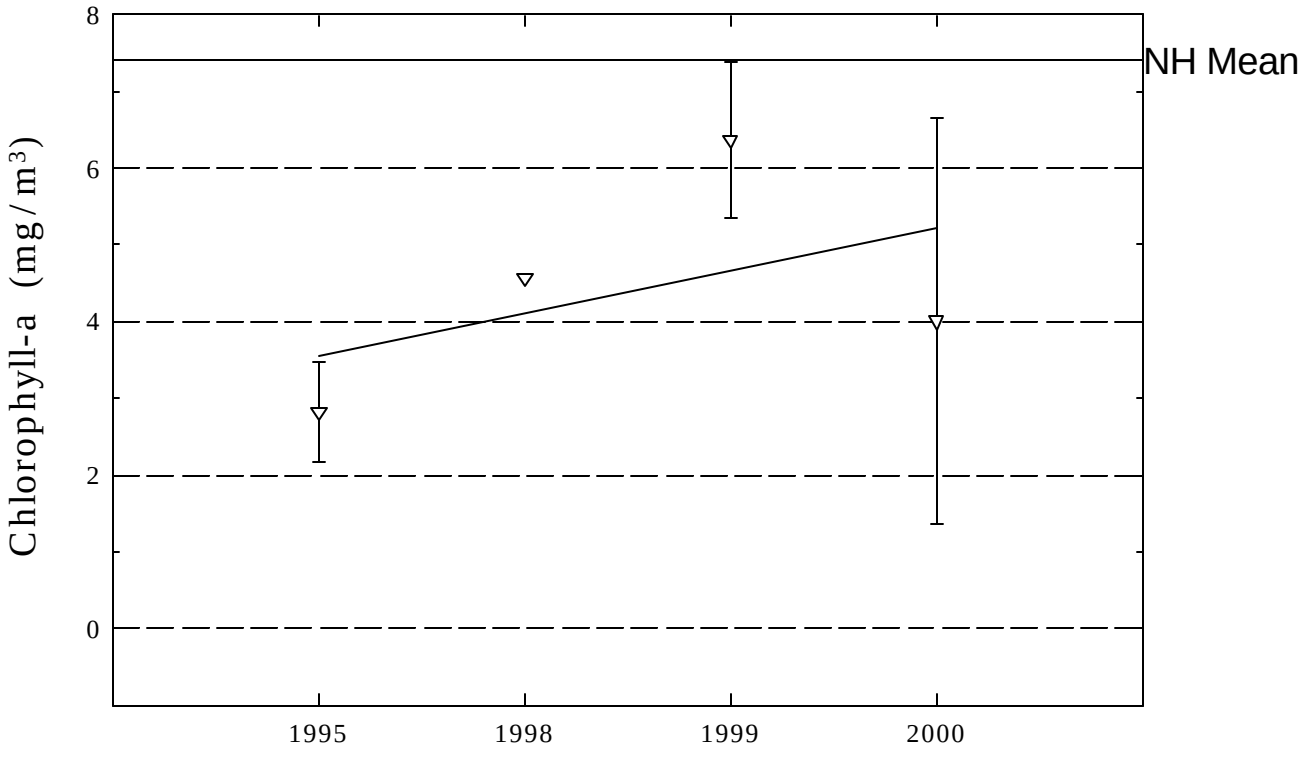
Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1998	1.1	1.1	1.1
	1999	0.5	0.6	0.6
	2000	0.3	0.5	0.4
HYPOLIMNION				
	1998	1.2	1.2	1.2
	1999	0.4	0.4	0.4
	2000	0.2	0.6	0.4

Little Round Pond, Station 2

Figure 1. Monthly and Historical Chlorophyll-a Results



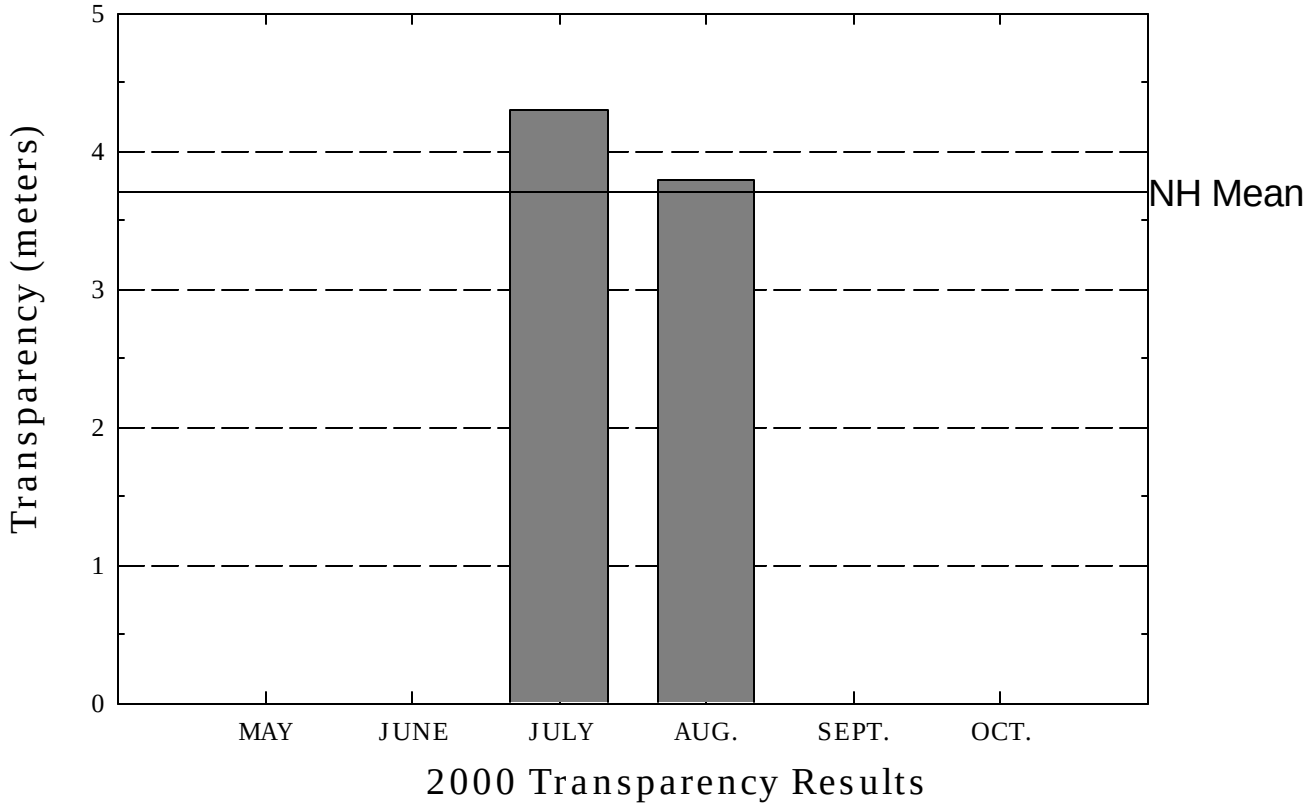
2000 Chlorophyll-a Results

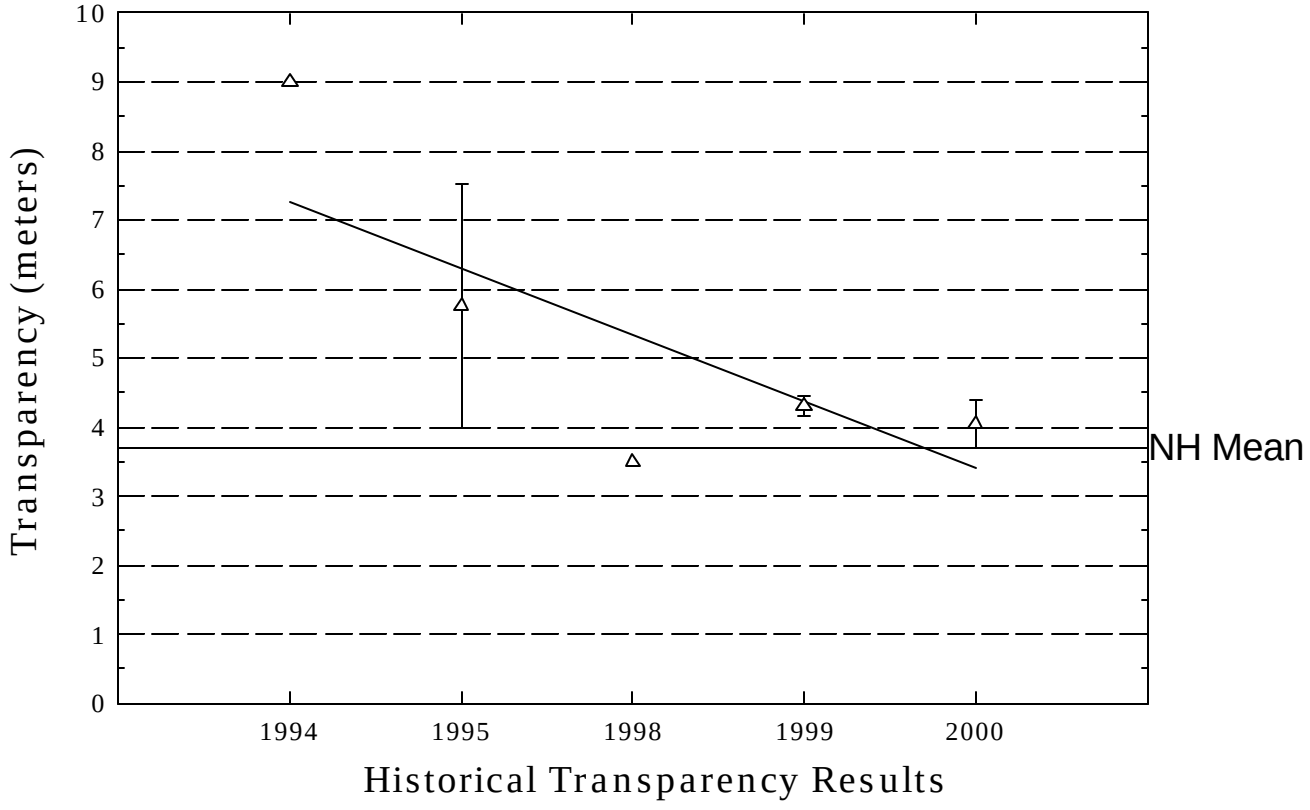


Historical Chlorophyll-a Results

Little Round Pond, Station 2

Figure 2. Monthly and Historical Transparency Results





Little Round Pond, Station 2

Figure 3. Monthly and Historical Total Phosphorus Data.

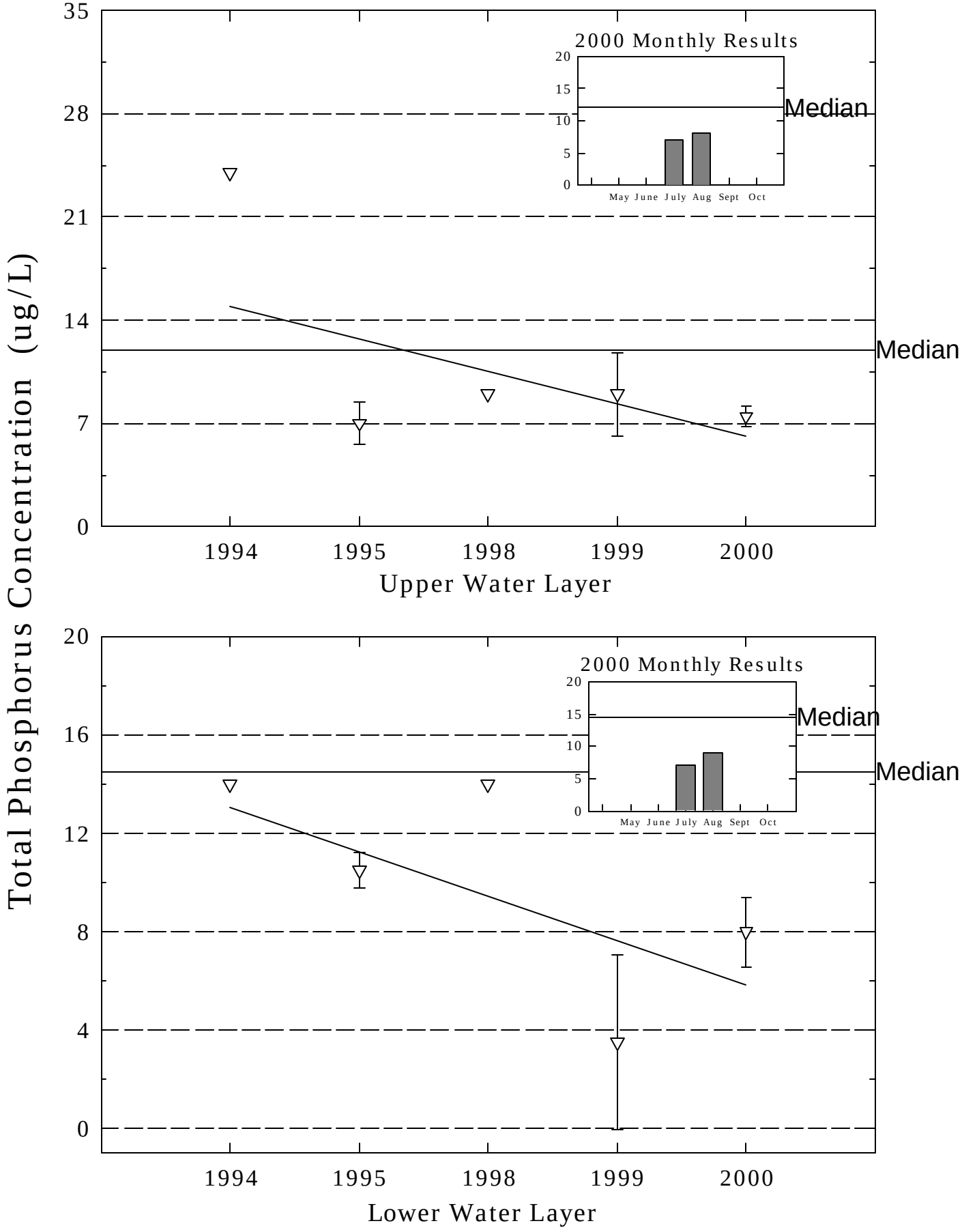


Table 1.

ROUND POND, LITTLE STN #2

WAKEFIELD

Chlorophyll-a results (mg/m^3) for current year and historical sampling periods.

Year	Minimum	Maximum	Mean
1995	2.37	3.29	2.83
1998	4.58	4.58	4.58
1999	5.66	7.09	6.37
2000	2.13	5.88	4.00

Table 2.

ROUND POND, LITTLE STN #2

WAKEFIELD

Phytoplankton species and relative percent abundance.

Summary for current and historical sampling seasons.

Date of Sample	Species Observed	Relative % Abundance
08/21/1995	CHRYSOSPHAERELLA	82
	DINOBRYON	10
	SPAEROCYSTIS	4
07/09/1999	DINOBRYON	56
	EUDORINA	20
	STAURASTRUM	8
08/01/2000	DINOBRYON	89
	UROGLENOPSIS	8
	STAURASTRUM	1

Table 3.

ROUND POND, LITTLE STN #2

WAKEFIELD

Summary of current and historical Secchi Disk transparency results (in meters).

Year	Minimum	Maximum	Mean
1994	9.0	9.0	9.0
1995	4.5	7.0	5.7
1998	3.5	3.5	3.5
1999	4.2	4.4	4.3
2000	3.8	4.3	4.0

Table 4.

ROUND POND, LITTLE STN #2

WAKEFIELD

pH summary for current and historical sampling seasons.
Values in units, listed by station and year.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1994	6.48	6.48	6.48
	1995	6.14	6.44	6.26
	1998	6.53	6.53	6.53
	1999	6.32	6.42	6.37
	2000	6.46	6.49	6.47
HYPOLIMNION				
	1994	6.46	6.46	6.46
	1995	5.93	6.64	6.15
	1998	6.54	6.54	6.54
	1999	6.07	6.24	6.15
	2000	6.34	6.46	6.40

Table 5.

ROUND POND, LITTLE STN #2

WAKEFIELD

Summary of current and historical Acid Neutralizing Capacity.
Values expressed in mg/L as CaCO .

Epilimnetic Values

Year	Minimum	Maximum	Mean
1994	2.40	2.40	2.40
1995	2.50	2.80	2.65
1998	2.20	2.20	2.20
1999	1.90	2.40	2.15
2000	2.10	2.30	2.20

Table 6.

ROUND POND, LITTLE STN #2
WAKEFIELD

Specific conductance results from current and historic sampling seasons. Results in uMhos/cm.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1994	53.4	53.4	53.4
	1995	50.4	50.6	50.5
	1998	66.1	66.1	66.1
	1999	70.3	70.3	70.3
	2000	74.1	75.7	74.9
HYPOLIMNION				
	1994	52.9	52.9	52.9
	1995	50.7	50.8	50.7
	1998	66.5	66.5	66.5
	1999	70.6	71.1	70.8
	2000	74.0	75.6	74.8

Table 8.

ROUND POND, LITTLE STN #2

WAKEFIELD

Summary historical and current sampling season Total Phosphorus data. Results in ug/L.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1994	24	24	24
	1995	6	8	7
	1998	9	9	9
	1999	7	11	9
	2000	7	8	7
HYPOLIMNION				
	1994	14	14	14
	1995	10	11	10
	1998	14	14	14
	1999	1	6	3
	2000	7	9	8

Table 9.

ROUND POND, LITTLE STN #2

WAKEFIELD

Current year dissolved oxygen and temperature data.

Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
		August 1, 2000	
0.1	22.3	7.1	81.5
1.0	22.3	7.0	80.3
2.0	22.3	7.0	80.2
3.0	22.3	6.9	79.2
4.0	22.3	6.9	79.4
4.5	22.2	6.9	79.5

Table 10.

ROUND POND, LITTLE STN #2

WAKEFIELD

Historic Hypolimnetic dissolved oxygen and temperature data.

Date	Depth (meters)	Temperature (celsius)	Dissolved Oxygen (mg/L)	Saturation (%)
August 21, 1995	4.0	25.1	8.1	98.0
July 9, 1999	4.5	24.9	7.3	88.4
August 1, 2000	4.5	22.2	6.9	79.5

Table 11.

ROUND POND, LITTLE STN #2

WAKEFIELD

Summary of current year and historic turbidity sampling.
Results in NTU's.

Station	Year	Minimum	Maximum	Mean
EPILIMNION				
	1998	0.0	0.0	0.0
	1999	0.3	0.4	0.4
	2000	0.3	0.3	0.3
HYPOLIMNION				
	1998	1.3	1.3	1.3
	1999	0.3	0.4	0.4
	2000	0.4	0.5	0.4